American mammals, — a law it took naturalists fifty years longer to develop and formulate, — since Bartram repeatedly alludes to the smaller size of animals of the same species in Georgia and Florida than in Pennsylvania, especially the wolves, deer, foxes, "and other animals." At page 216 of his Travels, for instance, after referring to the small size of the horses of Florida, he says, "It is a matter of conjecture and inquiry, whether or not the different soil and situation of the country may have contributed in some measure in forming and establishing the difference in size and other qualities betwixt them. I have observed the horses and other animals in the high hilly country of Carolina, Georgia, Virginia, and all along our shores, are much larger and stronger than those bred in the flat country next the sea-coast; a buck-skin of the Upper Creeks and Cherokees will weigh twice as heavy as those of the Siminoles or Lower Creeks, and those bred in the low flat country of Carolina."

THE HARVARD SUMMER SCHOOL OF GEOLOGY.

BY PROFESSOR N. S. SHALER.

THE first session of this, the last to be established of the several schools for summer teaching which have been originated by the officers of Harvard University, held its first session at Cumberland Gap, Kentucky, during the past summer. The design was to give practical field instruction in geology to teachers and others of some training in science and general culture, who might desire to acquire the methods of such work. The Governor of Kentucky having given an invitation to the President of Harvard College to place the school in Kentucky, and having offered the coöperation of the Kentucky Geological Survey, the school was established at Cumberland Gap, within the State of Kentucky but near to the state lines of Tennessee and Virginia. Though remote from the routes of travel, this point offered peculiar advantages for the study of stratigraphic, topographical, and dynamic geology. The structure of the Appalachian mountain system is exceedingly well shown at this point; the section extends from the lower Potsdam sandstone to the middle coal measures, giving about twelve thousand feet of beds within forty miles of distance; a wonderful system of faults of different ages bring these beds to view at many different points and enable the student to observe them under varied conditions; a short distance away, within plain

view, lies the great Unaka chain, where are found the highest points in eastern North America. The rocks are generally rich in fossils, the section, taking it altogether, giving a peculiarly good illustration of the life of the American palæozoic rocks. The subcarboniferous and Upper Cambrian limestones being very massive, afford a remarkable series of caverns, some of great extent and many abounding in human remains.

Despite a season of great and unprecedented rain-fall, nearly thirty inches in two months, there was no serious illness in the camp.

Restrictions were put on the number of students, more applications having been rejected than accepted. The class in attendance numbered thirty-one persons, more than half of whom were teachers engaged in science-instruction in various academies, normal schools and colleges in different parts of the country.

The instruction consisted of lectures and practical work in the field, the latter occupying by far the larger part of the time. The routine of work was about as follows: at six A. M. a lecture and discussion on the last field work; another lecture in the evening, generally on some zoölogical subject. The daylight was used in field-work near camp, except by those who were out on larger excursions; two or three of the excursions, each occupying from two to four days, were made each week; parties of from four to twelve, with one or more instructors, made a foot journey together over a section of the neighboring field. Each party had a wagon or pack mule, according to the country, and an outfit of provisions and camp utensils for rough camping. On its return the party was expected to report the results of its work at one of the evening meetings. Most of the students made great progress in the field-work, some of them being brought to the point of making extended journeys, from which they would bring back well-digested reports, without the guidance of an instructor.

The following gentlemen were engaged in the administration and instruction of the school: Mr. N. S. Shaler, Professor of Palæontology of Harvard University, and Director of the Kentucky Geological Survey; Mr. Walter Faxon, Instructor in Zoölogy of Harvard University; Messrs. Lucian Carr, A. R. Crandall, F. N. Moore, W. B. Page, C. J. Norwood, John H. Talbutt, and John R. Proctor, Assistants in the Kentucky Geological Survey. Professors Safford and Kerr, State Geologists of North Carolina and Tennessee respectively, assisted in the instruction either in the camp or in the field. Professor Jordan, of Northwestern Univer-

sity, Indianapolis, Indiana, gave some instruction in ichthyology. Near the close of the work, in the latter part of August, several parties were organized to afford the students the opportunity of making extended journeys in the direction of their homes. One or these parties made a journey of two weeks and another of four weeks through the mountains of eastern Kentucky and Virginia. Professor Kerr accompanied a party through a part of the mountains of North Carolina.

The instruction of the camp began July 1st and closed August 30th. It is proposed to hold the next session of the school at or near the same point, in 1876. The number of students admitted will probably be increased to fifty, and the other conditions will remain the same. The eminent success of the experiment was in the main due to the coöperation of the Kentucky Geological Survey. This survey furnished six skilled persons, who had been trained in the study of the rocks of the State, to the list of teachers. It is satisfactory to note that this assistance was given without any detriment to the researches of the survey, it being found that the students were a help rather than a hindrance to the work of the assistants.

It should be noted that the class was limited to persons who were graduates, or who were actually engaged in teaching or in fitting themselves for the work of professional geologists.

ANCIENT RUINS IN SOUTHWESTERN COLORADO.

MR. W. H. JACKSON, the photographer to Professor Hayden's United States Geological Survey of the Territories, describes and figures in the Bulletin (second series, No. 1) of the survey certain ancient ruins of Indian structures discovered in the valleys and gorges of the extreme southern corner of Colorado Territory.

One of the most perfect houses seen was discovered in the crevices of the escarpment of the Mancos Cañon, eight hundred feet vertically above the stream at its bottom. This house (Plate III., Fig. 12; this and plates I. and II. were kindly loaned by Professor Hayden) is two storied, and remarkable, not only on account of its elevated and almost inaccessible position, but from the pains with which it was built, the walls having been constructed of carefully dressed stone, plastered within and painted in two colors.